United States Department of Agriculture | Forest Service | Southwestern Region | 517 Gold Avenue SW. Albuquerque, NM 87102-0084

Caring for the Land and Serving People

Reply to: 3420 **Date:** December 29, 1987

Subject: Western Spruce Budworm Evaluation, 1987

To: Forest Supervisor, Santa Fe National Forest

During July and September, Forest Pest Management entomologists monitored and evaluated western spruce budworm, Choristoneura occidentalis, Free., caused defoliation and populations on portions of the Santa Fe National Forest. Defoliation was monitored through aerial detection and ground surveys. Population trends were assessed in three specific locales using egg mass surveys. The following paragraphs summarized these survey results, predict trends for 1988, and make management recommendations.

Forest-wide, aerially detectable defoliation declined markedly from 1986. The area defoliated in 1987 was 54,360 acres compared to 164,380 acres in 1986 (Table 1). Defoliation decreased substantially on all Ranger Districts except Coyote, where there was a significant increase, and the Jemez Indian Reservation. Figures 1-5 depict 1987 defoliation levels.

Jemez Ranger District. Aerially detectable defoliation decreased from 13,040 acres in 1986 to only 440 acres, north of Fenton Lake, in 1987. While little defoliation was detected from the air, ground observations in Lake Fork Mesa, Holiday Mesa, and Paliza Canyon indicated light defoliation (<35% of new growth) of these areas.

Egg mass surveys were conducted within the Integrated Pest Management (IPM) Demonstration Area as part of a Forest request to increase monitoring efforts in this project area. In the IPM Demonstration Area, 13 locations were sampled to estimate budworm egg mass density. The mean sample estimate was 5.3 egg masses per meter square foliage (Table 2). Egg mass densities in 1986 were 10.8 per meter square. No defoliation was observed during the aerial survey; however, during the egg mass collections, light defoliation (<35% of new growth) was noticeable at numerous sample points. These data indicate largely undetectable to light defoliation (<5% and <35% of new growth, respectively) can be expected in 1988.

No other locations on the District were sampled. However, based on existing trends, we predict little, if any, budworm activity on the District in 1988.

Pecos Ranger District. Again, aerially detectable defoliation declined dramatically from 12,840 acres in 1986 to 480 acres in 1987. Egg mass collections were made in Dalton and Holy Ghost Canyons. These data indicate largely light defoliation with some areas of moderate (35 to 65% of the new growth) expected in 1988 (Table 2). During the egg mass survey, two locations within Holy Ghost Canyon were observed moderately defoliated, while sample areas in Dalton Canyon showed little or no defoliation.

Western spruce budworm egg mass densities in the Pecos River drainage have shown a slight increasing trend the last few years (1984-3.1/meter square, 1985-9.7/meter square, 1986-11.4/meter square, and 1987-15.6/meter square). Aerially detectable defoliation peaked in 1985 (14,150 acres), with a large decline in 1987. We anticipate in 1988 the area defoliated will increase possibly to the level experienced in 1985 and 1986.

Espanola Ranger District. Defoliated area dropped markedly from 44,820 acres in 1986 to 1,800 acres in 1987. Egg mass surveys were conducted in the vicinity of the Pajarito Ski Area where budworm activity has been an issue in recent years.

For the Pajarito Ski Area, budworm population levels and defoliation for 1988 are predicted to be low and undetectable (<5% of new growth), respectively (Table 2). No defoliation was observed during either the aerial survey or the egg mass survey.

Egg mass surveys were not conducted on any other District locations. However, based on recent trends, some defoliation may be evident along Forest Road 101 to the Santa Fe Ski Basin.

Coyote Ranger District. Aerially detectable defoliation increased significantly in area during 1987 (19,480 acres) from 1986 estimates (11,280 acres). Most of the increase occurred in Gurule Mesa, including 2,400 acres of moderate defoliation. No egg mass collections were made on this District. However, based on recent defoliation trends, we anticipate continued defoliation, possibly at moderate levels, in 1988.

Cuba Ranger District. Defoliation decreased dramatically in area from 81,400 in 1986 to 50,920 in 1987. The Sierra Nacimiento's continued to show defoliation with many areas exhibiting top-kill. No egg mass surveys were conducted; however, the infestation is expected to continue in 1988.

Las Vegas Ranger District. No defoliation was detected from the air during 1987. We anticipate no defoliation will be evident in 1988.

Recommendation. No direct suppression activities are recommended for any infestations during 1988.

Where opportunities exist to reduce stand susceptibility and vulnerability to future outbreaks using silvicultural techniques, a reasonable effort should be made to achieve this objective. Forest Pest Management specialists are available to assist in these efforts, through participation in various interdisciplinary teams or other types of technical assistance.

Douglas L. Parker

DOUGLAS L. PARKER
Director of Forest Pest Management

Enclosures (7)

cc:
BIA, Albuquerque
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TABLE 1--Acreage of aerially detected defoliation, 1987.

District	Light	Moderate	Total	Change ± from 1986
Coyote	17,080	2,400	19,480	+8,200
Cuba	30,480	---	30,480	-50,920
Espanola	1,800	---	1,800	-43,020
Jemez	440	---	440	-12,600
Las Vegas	---	---	0	---
Pecos	480	---	480	-12,360
Jemez IR	1,680	---	1,680	+680
Total	51,960	2,400	54,360	-110,030

TABLE 2--Egg mass survey results, 1987.

Plot	Locale	EM/M^2	[1]87 Defoliation	[1]88 Prediction
IPM DEMONSTRATION				
1	Los Griegos	1.7	Undetectable	
2	Los Griegos	1.9	Undetectable	
3	Los Griegos	4.7	Undetectable	
4	Road 280	2.2	Light	
5	Road 280	1.0	Undetectable	
6	Road 280	7.8	Light	
7	Road 281	1.8	Light	
8	Road 281	0.9	Light	
9	Road 281	2.1	Undetectable	
10	Cerro Pelado	6.0	Undetectable	
11	Cerro Pelado	0.0	Undetectable	
301	Los Griegos	29.4	Undetectable	
701	Los Griegos	9.7	Undetectable	
13 Plots	IMP Demo Area	$\bar{X}$=5.3 (SE 2.2)		Undetectable
PAJARITO SKI AREA				
12	Camp May	0.9	Undetectable	
13	Road 282	1.0	Undetectable	
14	Road 282	1.6	Undetectable	
15	E of Ski Area	0.0	Undetectable	
16	E of Ski Area	4.0	Undetectable	
17	E of Ski Area	0.0	Undetectable	
6 Plots	Pajarito	$\bar{X}$=1.1 (SE 0.6)		Undetectable
PECOS RANGER DISTRICT				
18	Dalton Canyon	2.5	Undetectable	
19	N. Dalton T.S.	28.5	Light	
20	N. Dalton T.S.	23.8	Undetectable	
21	N. Dalton T.S.	14.2	Undetectable	
22	N. Dalton T.S.	2.9	Undetectable	
23	Holy Ghost Canyon	27.4	Moderate	
24	Holy Ghost Canyon	10.2	Moderate	
7 Plots	Pecos RD	$\bar{X}$=15.6 (SE 4.2)		Light

[1]Undetectable - <5% new growth; Light - <5-35% new growth; Moderate - 35-65% new growth.

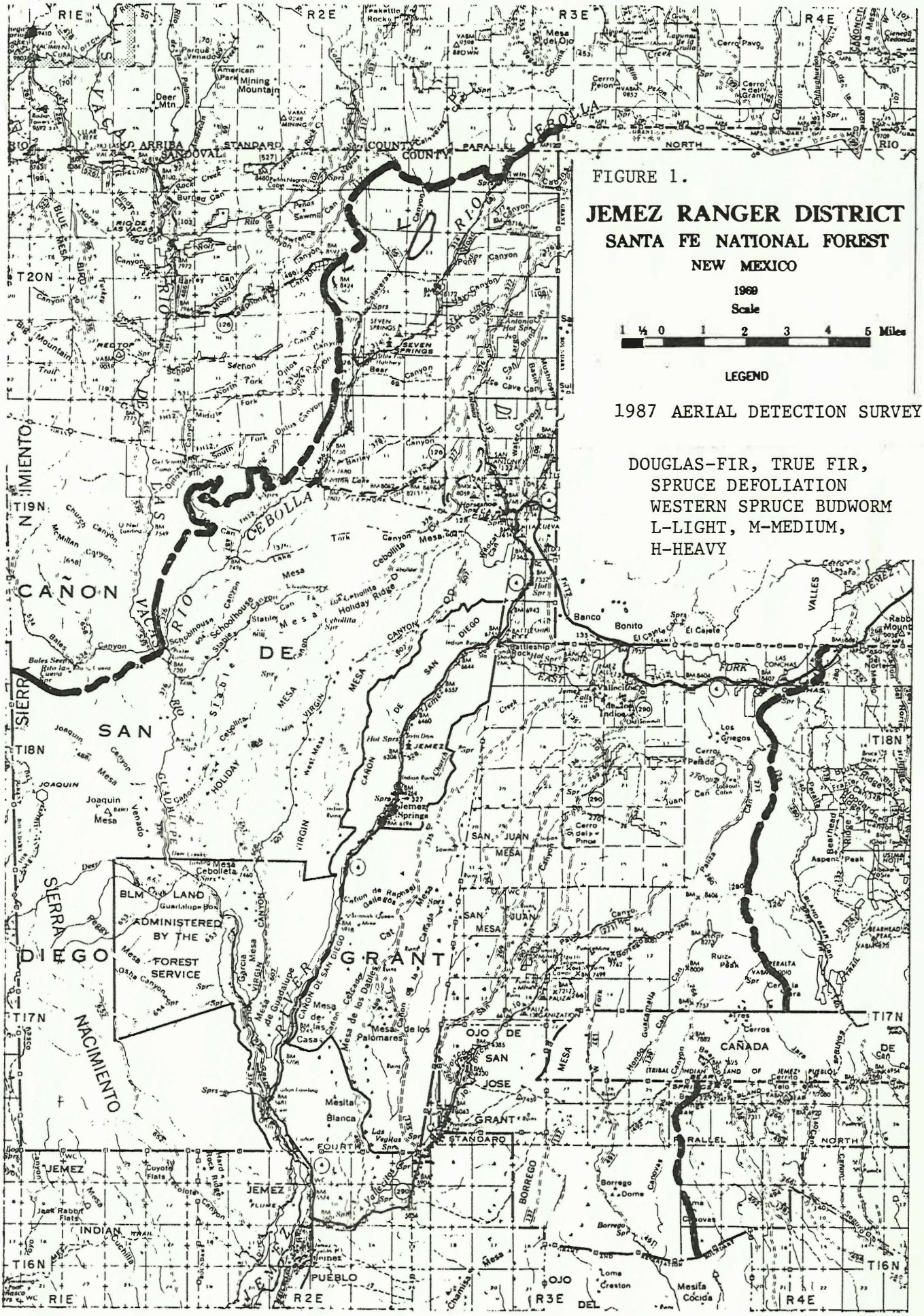


FIGURE 1.

JEMEZ RANGER DISTRICT

SANTA FE NATIONAL FOREST

NEW MEXICO

1989

Scale

1 ½ 0 1 2 3 4 5 Miles

LEGEND

1987 AERIAL DETECTION SURVEY

DOUGLAS-FIR, TRUE FIR,
SPRUCE DEFOLIATION
WESTERN SPRUCE BUDWORM
L-LIGHT, M-MEDIUM,
H-HEAVY

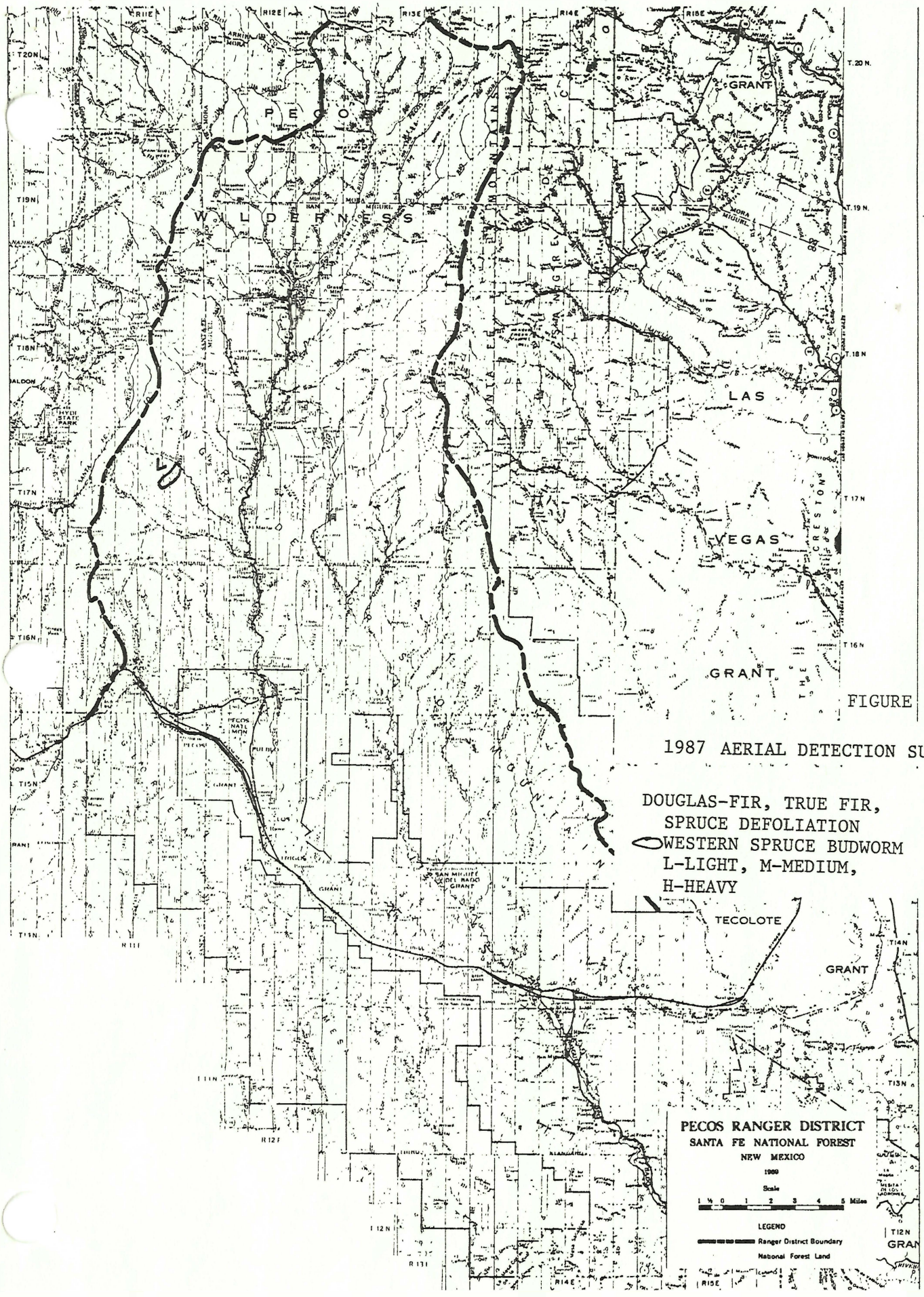
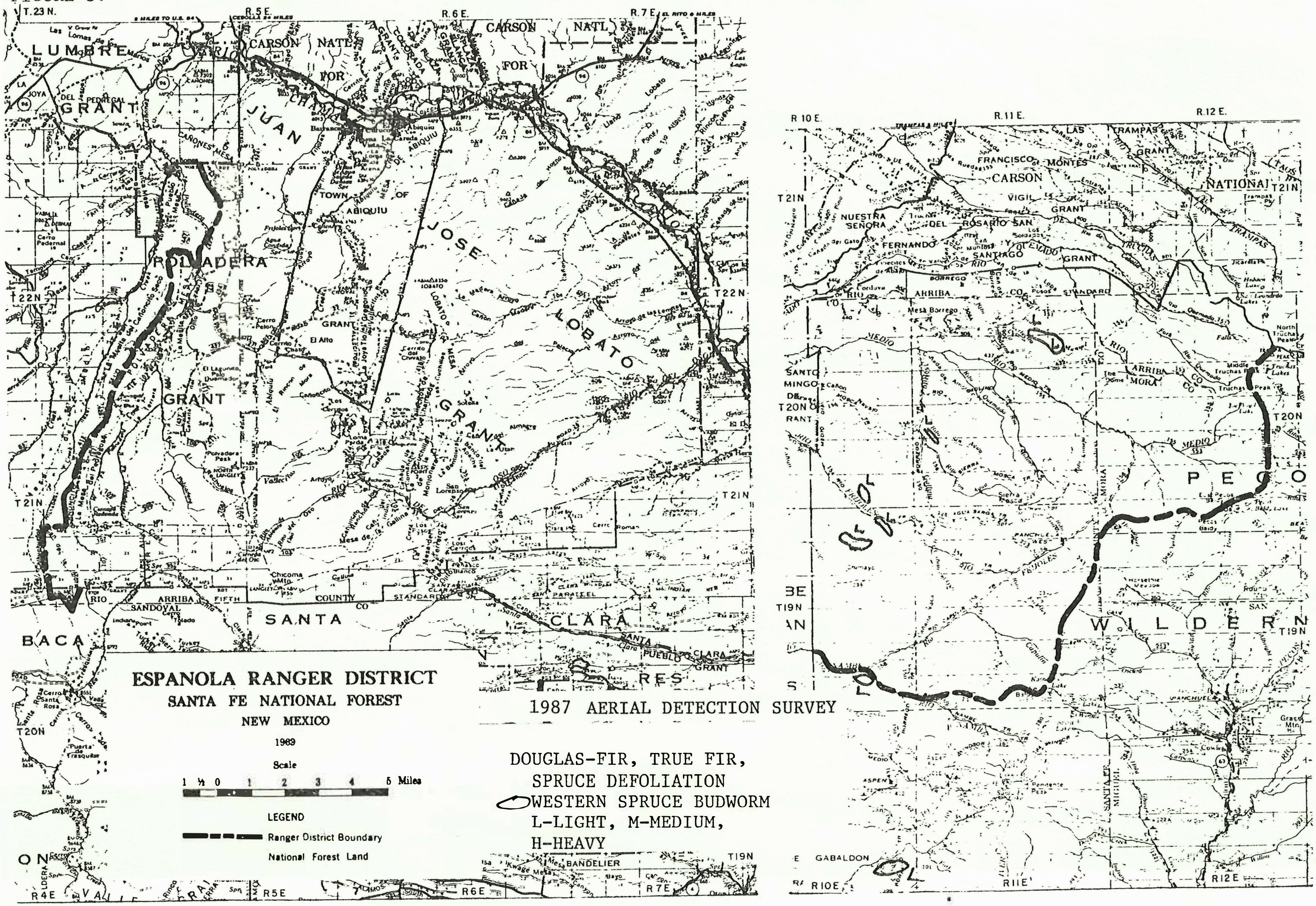
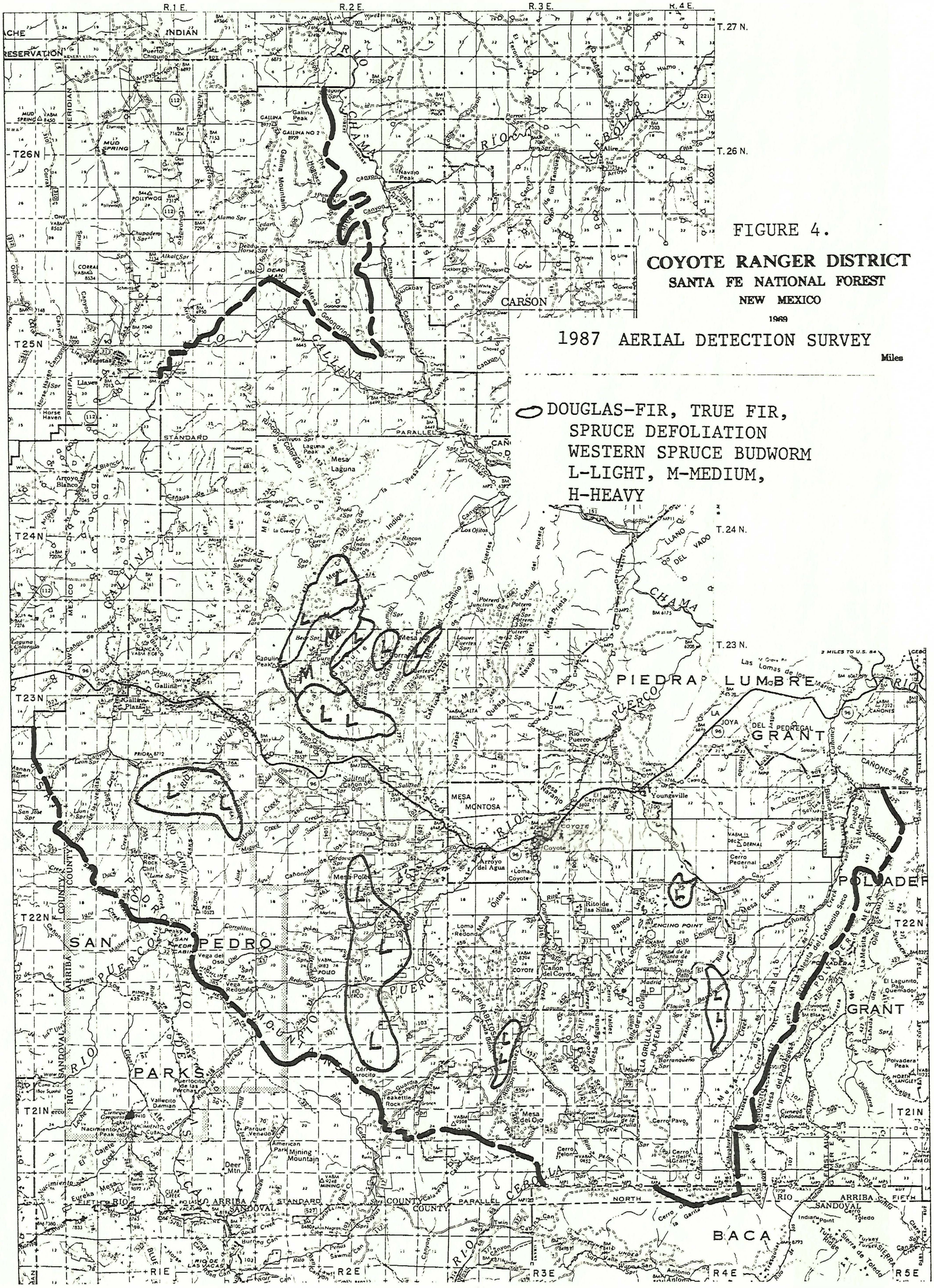


FIGURE 2.

1987 AERIAL DETECTION SURVEY

FIGURE 3.


ESPANOLA RANGER DISTRICT
SANTA FE NATIONAL FOREST
NEW MEXICO
1969
Scale
1 ½ 0 1 2 3 4 5 Miles
LEGEND
Ranger District Boundary
National Forest Land
1987 AERIAL DETECTION SURVEY
DOUGLAS-FIR, TRUE FIR,
SPRUCE DEFOLIATION
WESTERN SPRUCE BUDWORM
L-LIGHT, M-MEDIUM,
H-HEAVY


COYOTE RANGER DISTRICT
SANTA FE NATIONAL FOREST
NEW MEXICO
1969
1987 AERIAL DETECTION SURVEY
Miles
DOUGLAS-FIR, TRUE FIR,
SPRUCE DEFOLIATION
WESTERN SPRUCE BUDWORM
L-LIGHT, M-MEDIUM,
H-HEAVY
R.1 E.
R.2 E.
R.3 E.
R.4 E.
T.27 N.
T.26 N.
T.24 N.
T.23 N.
T26N
T25N
T24N
T23N
T22N
T21N
RIE
R2E
R3E
R4E
R5E
CARSON
PIEDRA LUMBRE
SAN PEDRO
PARKS
BACA
GRANT
Coyote
Youngsville
Gallina
FIGURE 4.

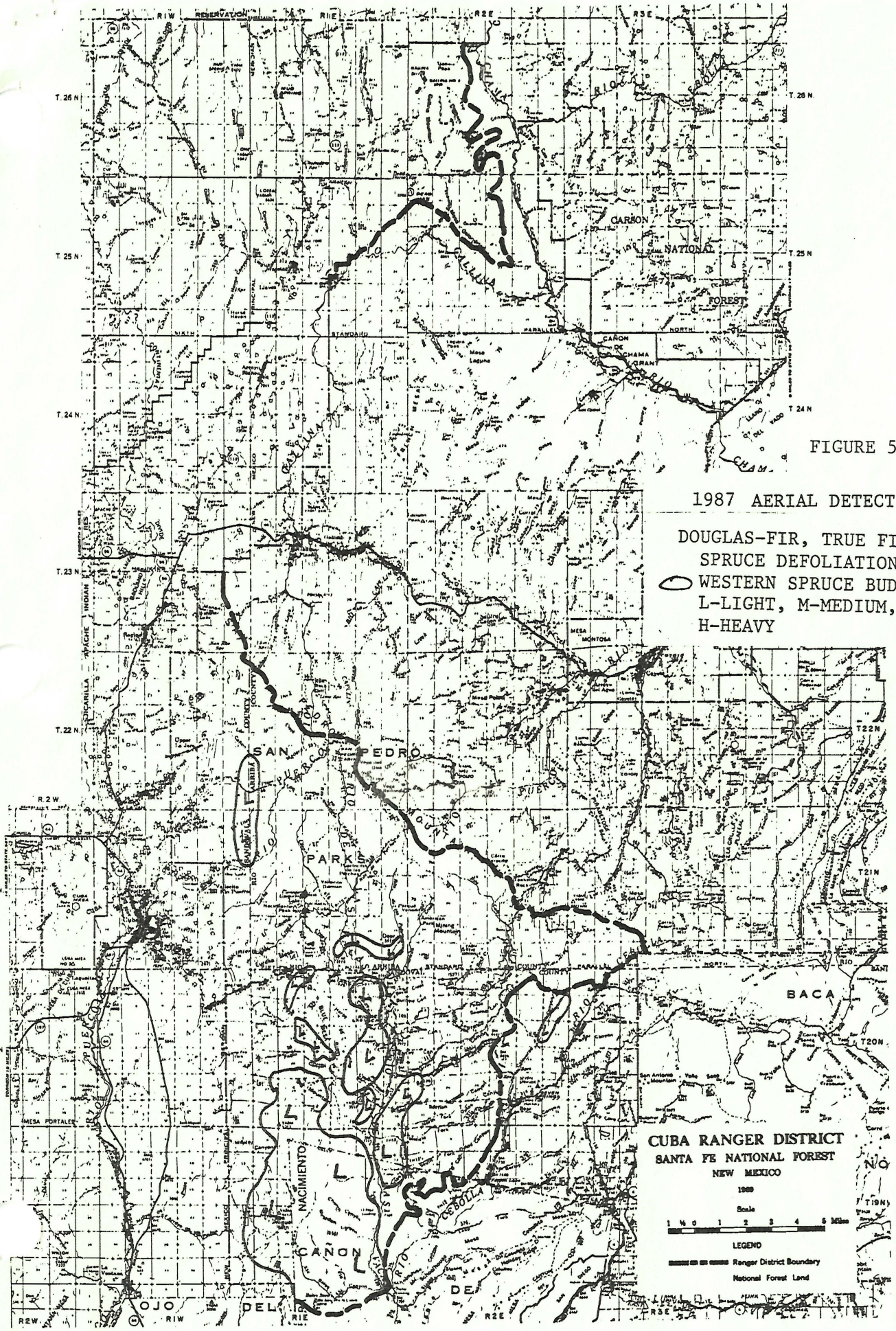


FIGURE 5.

1987 AERIAL DETECTION SURVEY

DOUGLAS-FIR, TRUE FIR,
SPRUCE DEFOLIATION
WESTERN SPRUCE BUDWORM
L-LIGHT, M-MEDIUM,
H-HEAVY